

Patent Claims

Tribological Fiber Composite Component

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1. A tribological fiber composite component in the form of, in particular, a brake or clutch disk employing a structure with at least one TFP preform (10, 26, 28, 36, 48, 60, 62, 76) having at least one stressable reinforcing fiber layer, the structure being stabilized by material deposition from the gas phase and/or provided with a monomer and/or polymer, hardened and pyrolyzed.
2. The fiber composite component according to claim 1, characterized in that the structure is stabilized, in particular, by CVI deposition with e.g. C, SiC, B₄C and/or Si.
3. The fiber composite component according to claim 1, characterized in that the structure is siliconized after the pyrolysis.
4. The fiber composite component according to claim 1, characterized in that the at least one TFP preform (10, 26, 28, 36, 48, 60, 62, 76) consists of areas or layers which differ from one another in their fiber volumes and/or their layer density and/or their fiber lengths and/or their fiber placement direction.
5. The fiber composite component according to claim 1, characterized in that the structure has at least two TFP preforms (26, 28, 60, 62) which are preferably constructed the same or essentially the same.
6. The fiber composite component according to claim 1, characterized in that the structure has recesses and/or channels optionally provided with cores.
7. The fiber composite component according to claim 1, characterized in that the fiber composite compound comprises a composite of at least one TFP preform (60, 62) and a layer and/or fabric and/or short fibers and/or felt and/or fleece (72, 74), 1391
8. The fiber composite component according to claim 1, characterized in that the TFP preform (60, 62) is provided with a layer (72, 74) of short fibers on the

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outside.

9. The fiber composite component according to claim 1, characterized in that the TFP preform (10, 26, 28, 36, 48, 60, 62, 76) has rovings with thread counts which differ from one another.
- 5 10. The fiber composite component according to claim 1, characterized in that the TFP preform (10, 26, 28, 36, 48, 60, 62, 76) has reinforcing fibers in the form of roving strands or fiber bands.
11. The fiber composite component according to claim 1, characterized in that the TFP preform (10, 26, 28, 36, 48, 60, 62, 76) has reinforcing fibers in the form of natural, glass, aramide, carbon and/or ceramic fibers.
- 10 12. The fiber composite component according to claim 1, characterized in that the TFP preform (36, 48, 76) consists of several layers (38, 40, 42, 44, 50, 52, 56, 80, 82, 84, 86) of placed reinforcing fibers, the direction of placement of the reinforcing fibers varying from one another in successive layers.
- 15 13. The fiber composite component according to claim 12, characterized in that the reinforcing fibers extend radially in a layer (38, 42, 50, 56).
14. The fiber composite component according to claim 12, characterized in that the reinforcing fibers extend in a circular manner in a layer (40, 44).
15. The fiber composite component according to claim 12, characterized in that the reinforcing fibers extend involutely in a layer (52, 54).
- 20 16. The fiber composite component according to claim 12, characterized in that the reinforcing fibers (16) extend in a layer extending from their central opening tangentially thereof.
17. The fiber composite component according to claim 1, characterized in that in a circular TFP preform (10, 26, 28, 36, 48, 60, 62, 76), the reinforcing fibers are placed in such a way that the pyrolyzed preform corresponds, or substantially corresponds, in its radial measurement to that of the preform.
- 25 18. The fiber composite component according to claim 1, characterized in that the reinforcing fibers are stitched together with polymer fibers and/or carbon fibers.
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19. The fiber composite component according to claim 1, characterized in that the reinforcing fibers of the TFP preform (10, 26, 28, 36, 48, 60, 62, 76) are stitched onto a base layer (46, 58) based on carbon, aramide and/or ceramic fibers and/or a fleece.
- 5 20. The fiber composite component according to claim 1, characterized in that the structure of a clutch disk comprises at least two TFP preforms (36, 48) having the same, or essentially the same, structure.
21. The fiber composite component according to claim 1 or 12, characterized in that the TFP preform (48, 76) consists of several layers (50, 52, 54, 80, 82, 84, 86),
10 the layers being placed symmetrically or substantially symmetrically with respect to the central symmetrical plane (78) of the TFP preform in their fiber orientation.
22. The fiber composite component according to claim 1 or 21, characterized in that the TFP preform (36, 48) consists of at least two layers (38, 40, 42, 44, 50, 52, 54, 56) or plies, one of the layers or plies (38, 42) being built from radially placed
15 reinforcing fibers and the remaining layer or ply (40, 44) of reinforcing fibers placed in a circular manner.
23. The fiber composite component according to claim 1 or 19, characterized in that layers or plies (38, 40, 42, 44, 50, 52, 54, 56) of the TFP preform are each stitched together with the base layer (46, 58).
- 20 24. The fiber composite component according to claim 1 or 12, characterized in that the TFP preform (48, 76) has fibers of the same or essentially the same orientation in its outer surfaces or layers (50, 56, 84, 86).
- 25 25. The fiber composite component according to claim 1, characterized in that the structure of a brake disk consists of at least two TFP preforms (26, 28, 60, 62) spaced from one another and which are connected to one another by webs (30, 32, 34, 44, 46) formed from reinforcing fibers.
26. The fiber composite component according to claim 1, characterized in that the TFP preform (62) has a thickening (68) formed by reinforcing fibers in the region of a force input point.
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27. The fiber composite component according to claim 26, characterized in that the reinforcing fibers are placed so as to cross one another in the thickening (68).
28. The fiber composite component according to claim 25, characterized in that the reinforcing fibers are placed so as to cross one another in the webs (64, 66).
29. The fiber composite component according to claim 1 or 26, characterized in that the TFP preform (60, 62) has a fleece layer (72, 74) on its free outer surfaces.